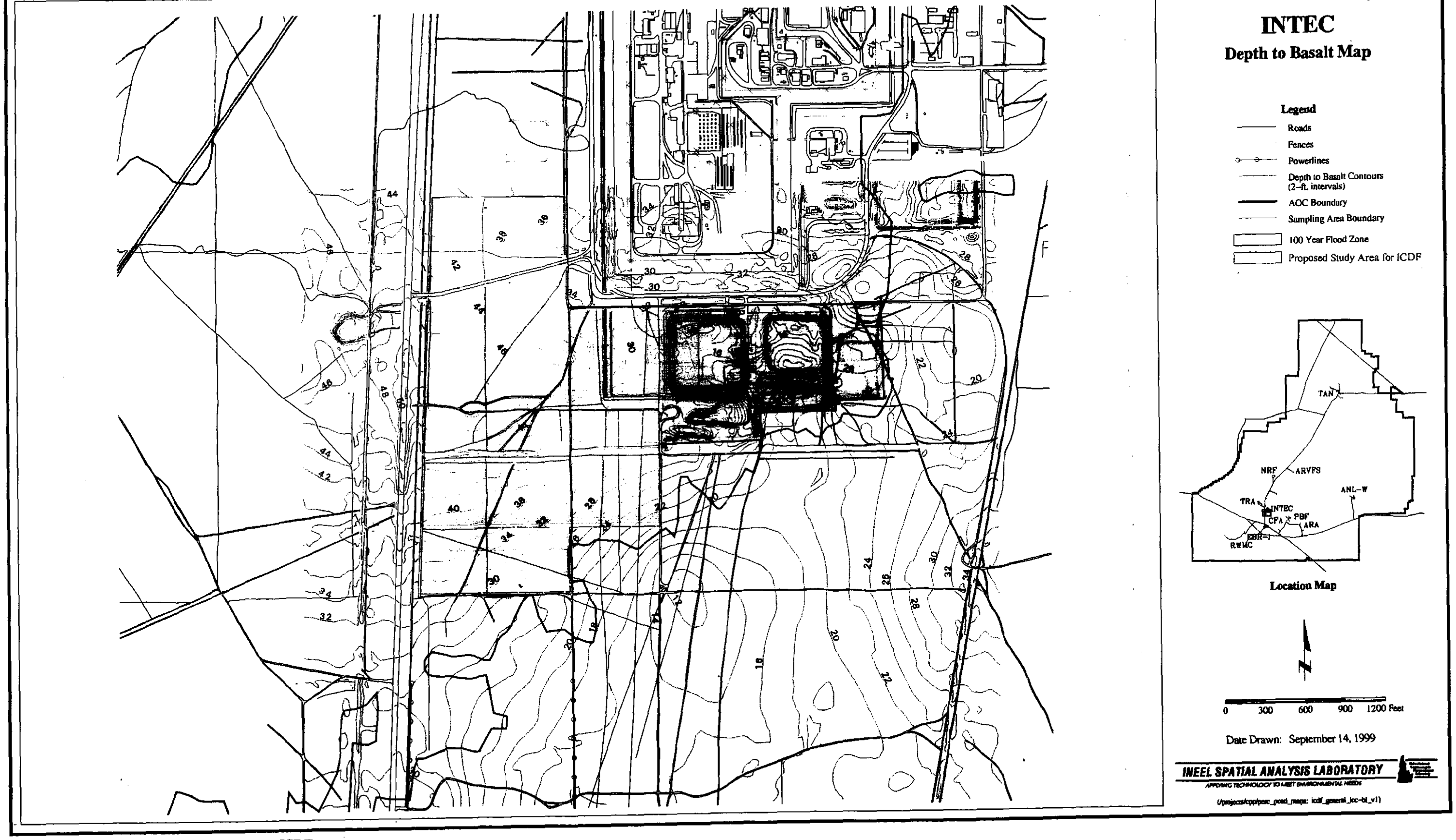



**Figure 11-4.** Proposed Study Area for the ICDF.

Figure 11-4 shows the proposed Study Area that the ICDF is to be sited in.

In special circumstances (e.g., Site CPP-37b), where a source area is located so as to become part of a D&D or closure cover, the Agencies may elect not to excavate the soil but cap in place in accordance with RCRA/Hazardous Waste Management Act (HWMA) closure standards. The same groundwater protection standards applicable to the ICDF will be met.

Although more costly than Alternative 3, which requires capping each Group 3 site in place, the selected Alternative 4A, reduces the footprint of the WAG 3 restricted area allowing for future development and is expandable to address INEEL-wide CERCLA contaminated media and debris. Further, the consolidation in an engineered landfill with leachate collection will further safeguard the underlying SRPA. The Agencies believe that this alternative ensures long-term protection of human health and the environment, complies with ARARs, is a permanent solution, and is cost-effective.

### 11.1.4 Perched Water (Group 4)

The selected remedy for the Perched Water is Alternative 2—Institutional Controls with Aquifer Recharge Control. Alternative 2 is comprised of institutional controls in the form of administrative actions to restrict future use of perched water and implementation of remedies to control water infiltration and minimize perched water releases to the SRPA. The institutional controls include:

- Site access restrictions
- Warning signs on wells screened in the perched water
- Locked and labeled wells screened in the perched water
- Well drilling/water usage restrictions
- Radiation surveys
- Environmental monitoring
- General maintenance and upkeep.

The DOE will periodically inspect and repair the warning signs, conduct environmental monitoring, and perform routine maintenance and upkeep, as necessary. Land use controls will remain in place indefinitely to prevent unauthorized drilling through the contaminated perched zone.

Perched water monitoring will include sampling and analysis of existing and new perched water wells to determine changes in the areal extent of perched water (water levels and hydraulic head) and perched water quality. Moisture content and contaminant of concern (COC) concentration(s) will be measured in the perched water zones to determine if water contents and contaminant fluxes are decreasing as predicted. These data will also be used to verify the OU 3-13 vadose zone model and to determine potential impacts to the SRPA. The specific monitoring to determine perched water drain-out will be described in the OU 3-13 Group 4 Post-ROD Monitoring Plan. The monitoring will be performed for a minimum of 20 years after the percolation ponds are removed from service. The perched water zones related to the existing percolation ponds are calculated to drain out in approximately 14 years from the time the ponds are removed from service (OU 3-13 RI/FS, Appendix F). New perched water-monitoring wells will be installed to provide additional perched water monitoring locations. If after 5 years, the

perched water zones are not draining out as predicted by the RI/FS model then additional recharge controls will be implemented.

Additional controls may include:

- Lining, or an equivalent, the Big Lost River to minimize river recharge to perched water. A trade study will be performed to determine the most cost-effective method to achieve the recharge reduction objective.

- Curtailing steam condensate discharges to the subsurface

- Removing the existing STP lagoons and infiltration galleries. Substitute facilities that do not discharge to contaminated perched water (e.g., new sewage treatment pond lagoons) would need to be sited and constructed prior to implementing this control.

The additional recharge controls are actions that control sources supplying water to the perched zone. These actions are designed to reduce leaching and transport of soil contaminants to perched water, reduce the water content of the perched zone, and minimize contaminated perched water releases to the SRPA. Computer simulations indicate that removal of the existing percolation ponds from service is the most beneficial method to prevent the COCs in the vadose zone (particularly Sr-90) from reaching the SRPA. Removal of the existing percolation ponds from service addresses approximately 70% of the water recharging the perched water bodies and sufficiently slows the rate of contaminant transport to the aquifer to allow natural radioactive decay to reduce the Sr-90 mass in the vadose zone. This action is expected to prevent perched water contaminant releases to the SRPA, which would cause the MCLs to be exceeded in the SRPA beyond 2095 (FS Supplement, Section 5.3.2 [DOE-ID 1998a]).

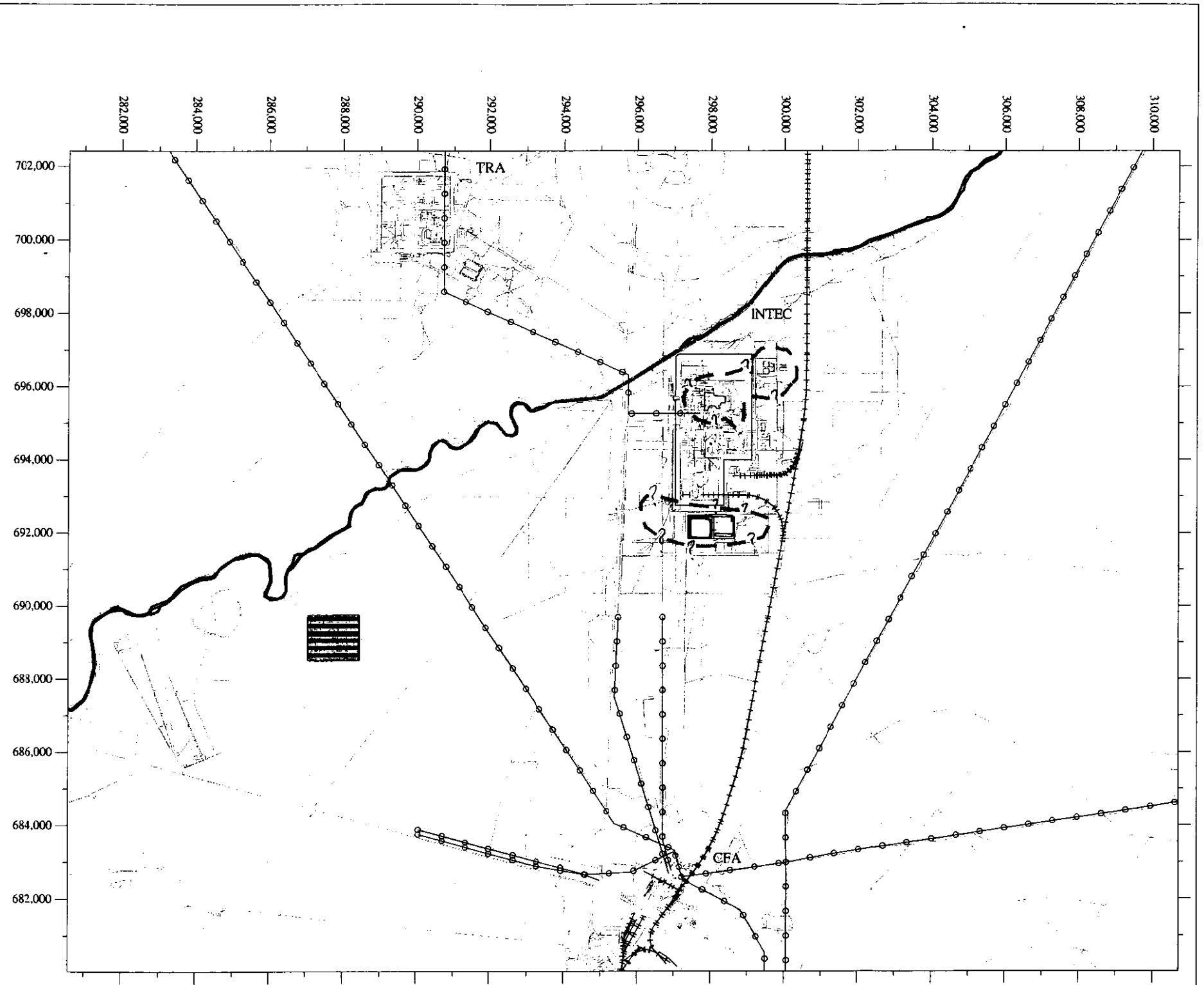
The replacement percolation ponds will be constructed at a sufficient distance (approximately 10,200 ft) away from the INTEC Facility so as to no longer remain a recharge source to the contaminated perched water beneath INTEC. The locations of the new percolation ponds were based on the measured presence of perched water at the current percolation ponds and groundwater modeling. The amount of "spread" of water from new percolation ponds in the uppermost perched layer was modeled using the interbed parameters from the OU 3-13 vadose zone modeling (OU 3-13 FS, Appendix F). The new ponds are located so that perched water from them does not spread to the contaminated perched water beneath INTEC. Figure 11-5 shows the proposed location of the replacement percolation ponds. Other factors evaluated in selecting a new location for the percolation ponds include: locating the ponds outside of any rare, threatened, or endangered habitat, and locating the ponds in areas that have been surveyed for cultural and historic artifacts.

The replacement percolation ponds, limited to 80 acres in size, will be subject to applicable permitting requirements. The Agencies believe that sufficient time is provided prior to the removal date to assure that this contingency operation under CERCLA will not be necessary. However, due to the necessity and importance of stopping the recharge to the perched water on or before December 31, 2003, the new percolation ponds will be constructed under this ROD and may operate, as a necessary contingency, pursuant to this ROD during the interim period that applicable permits are sought.

The Group 4 remedy will include:

- Removing the existing percolation ponds from service

- Discontinuing lawn irrigation at the INTEC where necessary.




# New Percolation Pond Area

N
W E
S

## Legend

- Roads and Buildings
- Railroads
- Powerlines
- Percolation Ponds, Tank Farm, INTEC Boundary
- Big Lost River
- INTEC Perched Water Contours (measured)
- Approximate New Percolation Pond Area

Reference:

DOE/ID, "Comprehensive RI/FS for the Idaho Chemical Processing Plant OU3-13 at the INEEL – Port A. RI/BRA Report (Final)", U.S. Dept. of Energy DOE/ID-10534, November 1997.

0 1 2 3 km

0 1 2 Miles

Date Drawn: August 23, 1999

**INEEL SPATIAL ANALYSIS LABORATORY**

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(/projects/cpp/new_perc_pond_maps: interbed_basemap-bl_v4)

**Figure 11-5.** Location of replacement percolation ponds.

Additional infiltration controls may include lining or diverting the Big Lost River, repairing leaking fire water lines at the INTEC, curtailing steam condensate discharges to the subsurface, or removing the existing STP lagoons and infiltration galleries. Substitute facilities that do not discharge to the zone of contaminated perched water would need to be sited and constructed prior to implementing this phase.

Five-year reviews of the efficiency of this remedy will be conducted until the Agencies determine that there is no longer a risk posed by vadose zone contaminants leaching to the SRPA. Institutional controls will remain to restrict drilling through the contaminated zone or access to perched water.

Alternative 2 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment. The Agencies believe the selected alternative is protective of human health and the environment, compliant with ARARs, uses permanent solutions, and is cost effective.

### 11.1.5 Snake River Plain Aquifer Interim Action (Group 5)

The selected SRPA interim action is Alternative 2B—Institutional Controls with Monitoring and Contingent Remediation. This interim action alternative consists of three components:

- Maintaining existing and additional institutional controls over the area of the SRPA contaminant plume to prevent exposure to contaminated groundwater during the time the aquifer is expected to remain above MCLs

- Groundwater monitoring to determine if SRPA groundwater COC concentrations exceed their action levels and if the impacted portion of the aquifer is capable of producing more than 0.5 gpm, which is considered the minimum drinking water yield necessary for the aquifer to serve as a drinking water supply.

- Contingent active pump and treat remediation if the action levels are exceeded and production is greater than 0.5 gpm such that the modeled aquifer water quality will exceed the MCLs after 2095 in the SRPA outside the current INTEC security fence.

Since contaminants from INTEC operations will remain in the SRPA, a five-year review is required by the NCP (40 CFR 300.430[f][4][ii]). Five-year reviews will be conducted until the Agencies determine they are no longer necessary. The five year reviews will evaluate the effectiveness of the alternative and the need for its continuation or to consider a different alternative.

***11.1.5.1 Existing and Additional Institutional Controls.*** Existing institutional controls will prevent the groundwater ingestion exposure route from being completed by preventing direct access to the contaminated SRPA until the year 2095. Institutional controls will remain in place until 2095 and include:

- Area access restrictions

- Land use restrictions to prevent the installation of water supply wells in the SRPA prior to 2095

- A Notice of Agreement with affected federal and local government stakeholders

- Warning signs on wells screened in the SRPA contaminant plume
- Locked and labeled wells screened in the SRPA contaminant plume.

In addition to institutional controls, environmental monitoring and general maintenance and upkeep of monitoring wells will be conducted for as long as it is determined that monitoring is required.

***11.1.5.2 Groundwater Monitoring.*** Groundwater monitoring activities will be conducted throughout the institutional control period to evaluate the concentration and extent of contaminants in the SRPA. Monitoring will cease if the regulators determine there is no unacceptable risk in the aquifer. Monitoring will include sampling of the SRPA using new and existing wells to determine the SRPA aquifer intervals with the highest concentrations of groundwater COCs. The specific groundwater monitoring actions will be described in the OU 3-13 Post-ROD Monitoring Plan that will be developed during RD/RA. A general summary of the groundwater monitoring actions that would trigger subsequent treatability studies and contingent remediation is shown on the decision flow chart in Figure 11-6. Groundwater modeling presented in Appendix B of the FS Supplement (DOE-ID 1998a) suggests that the highest I-129 concentrations occur in the H-I interbed of the SRPA. The modeling accounts for attenuation and dispersion. The H-I interbed is a sedimentary interbed that is located approximately 38 m (125 ft) below the top of the SRPA water table. The water table at INTEC occurs at an approximate depth of 140 m (460 ft) beneath the INTEC. The H-I interbed is about 7.6 m (25 ft) thick and has a low permeability (4 mDarcy). The model also assumed that potential releases of contaminated perched water to the SRPA will be controlled by removing the existing percolation ponds from service.

Additional groundwater modeling and sampling will be conducted to determine the location of COC hotspot (Step 1 in Figure 11-6). Monitoring wells will be installed at the predicted hot spots along the centerline of the predicted plume. Packer tests will be used to determine the zone(s) of highest contamination. These results will be compared to the action levels (Table 8-2). Groundwater quality data will be obtained from the SRPA intervals containing the highest COC concentrations to determine if these concentrations exceed the action level(s) (Step 2 in Figure 11-6). The action levels are based on the modeled maximum concentration of the COCs measured in calendar year 2000 that are expected to yield individual contaminant concentrations above the MCLs in the SRPA outside the current INTEC security fence in 2095. Contaminant transport studies, and refinements to the contaminant transport model will continue during the institutional control and monitoring period. The action levels will be reviewed at each 5-year review and adjusted as necessary to insure that RAOs are being met.

If the action levels are exceeded (Step 3 in Figure 11-6), isopleth maps will be developed using the groundwater quality data. The isopleth maps will be developed (Step 4 in Figure 11-6) to determine if the hot spot(s) is(are) of sufficient volume to provide an unacceptable risk to a hypothetical groundwater user for more than one year (Step 5 in Figure 11-6). The isopleth maps will be prepared to determine if the plume will move past a future receptor such that the exposure duration would be too short to present an unacceptable risk. If the hot spot is small, or if it moves too quickly to present an unacceptable risk, then no further active measure would be pursued, but monitoring would continue and the data and modeling would be reviewed at the 5-year review period.

- If the contaminated aquifer interval exceeds the COC action level(s) and is of sufficient volume to potentially expose a hypothetical groundwater user to an unacceptable risk, representative wells will be selected to determine if the affected portion of the SRPA is capable of producing a sustainable yield (for at least 24 hours continuous pumping) of more than 0.5 gpm (Step 6 in Figure 11-6). The 0.5 gpm pumping rate is based on the minimum amount of drinking water necessary to sustain an average household. The wells that are selected to determine these limits will be screened over the aquifer interval exhibiting the

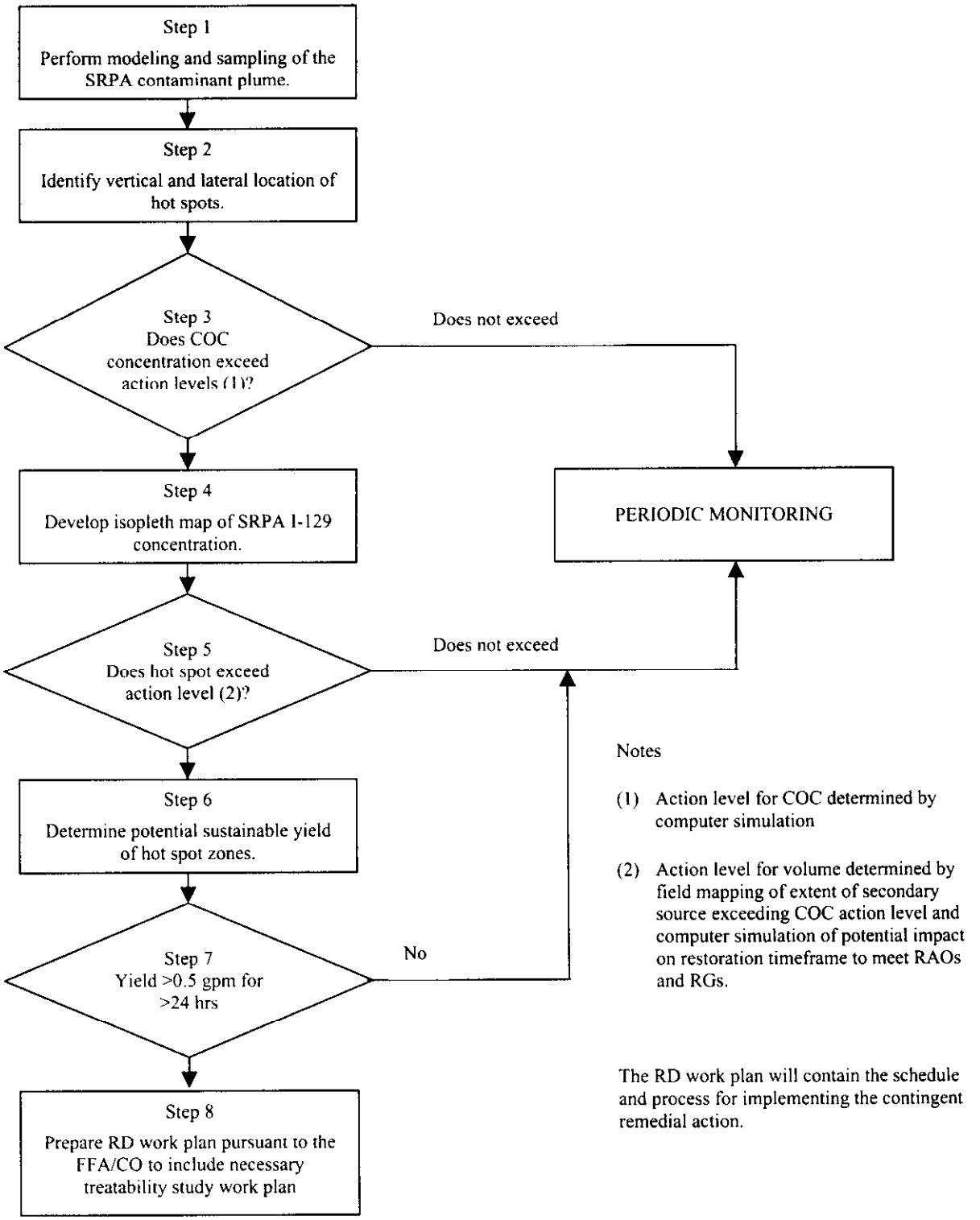


**Figure 11-6.** SRPA contingent remediation decision flow chart.

highest concentrations of COCs. If the water yield is greater than 0.5 gpm on a sustained basis, and the action level(s) is exceeded (Step 7 in Figure 11-6), then active remedial action will be pursued. If monitoring does not support the need for remedial action, periodic groundwater monitoring will be continued and the data reviewed during each 5-year reviews until restoration is achieved.

- **Treatability Studies and Contingent Remediation**. If all of the above described criteria (Steps 1 through 7 in Figure 11-6) are met for a well screened in the SRPA, treatability studies will be performed (Step 8 in Figure 11-6). The treatability studies may include analytical calculations and/or numerical modeling, pumping tests, and bench- or pilot-scale treatment testing. The treatability studies will determine if long-term pumping from the affected interbed is feasible and whether the COCs exceeding the action level(s) can be cost-effectively removed from groundwater. In addition to I-129 and other COCs the treatability studies will also evaluate the presence of mercury, Sr-90, chromium, Tc-99, and tritium, all of which are known or are predicted to be present in the groundwater plume at significant concentrations. While these contaminants are not long-term risk drivers, they may foul the groundwater treatment system or pose radiological exposure concerns if brought to the surface for treatment. Further monitoring will be performed to define the optimum path forward. The treatability study will be developed during RD if needed. If the treatability studies determine that selectively pumping and treating contaminated groundwater from the affected portions of the SRPA will meet the MCL(s) in 2095, and treatment and recharge or evaporation of treated groundwater is implementable and cost-effective, then Remedial Design and active remediation will be implemented.

Prior to installing a pump and treat system, the COC action limits will be verified or reestablished by additional modeling using the data obtained from the new monitoring wells, the packer tests, and pump/yield/concentration data. The duration of pumping and treatment will also be estimated using the model. If treatability studies determine that pumping the affected SRPA interbed is not technically feasible, then a technical impracticability waiver will be sought through a ROD Amendment.

Active remediation would consist of:

- Contingent pump and treat remedial action will be implemented if groundwater monitoring determines that combined COCs in groundwater exceed their respective action levels in the year 2000 or during subsequent monitoring. The action levels are based on modeling that predicts that individual or combined contaminants will exceed MCLs in the year 2095 for portions of the aquifer that is capable of sustaining a production of rate 0.5 gpm.Components of the pump and treat action include:

  - Installation of extraction wells to remove the zone of maximum contamination or hot spot

  - Above ground, on-site physical/chemical treatment of the extracted water in compliance with ARARs

  - On-site recharge to the SRPA or evaporation of the treated effluent in compliance with ARARs.

The treatability studies will consider the presence of all contaminants. Mercury, Sr-90, chromium, Tc-99, H-3, are known or are predicted to be present in the SRPA at significant concentrations. Although these additional contaminants are not necessarily long-term risk-drivers, they become problematic once brought to the surface for treatment because they may foul the treatment system or may pose radiological

exposure concerns, as in the case of Tc-99. In addition, all contaminants must be removed to below MCLs if the treated groundwater is injected into the aquifer.

Although Alternative 2A is less costly than the selected alternative 2B, it does not provide any reduction in toxicity, mobility or volume through treatment and may not meet the Remedial Action Objective of restoring the aquifer to drinking water quality by the year 2095. Therefore, the contingency remedy, Alternative 2B best addresses groundwater modeling concerns regarding aquifer restoration. The Agencies believe the selected alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

### 11.1.6 Buried Gas Cylinders (Group 6)

The selected remedy for the Buried Gas Cylinders is Alternative 2—Removal, Treatment, and Disposal. The basis of this remedy is the removal and management of buried cylinders from each burial site. Abandonment of the cylinders presents a safety hazard should the cylinders burst from over-pressurization. Alternative 2 consists of:

- Institutional controls (i.e., warning signs) until completion of the buried cylinders removal
- Site characterization using geophysical surveys
- Removing the gas cylinders
- Treating the contents, if necessary
- Recycling or disposing of the gas cylinder containers.

The remedy will consist of two phases. Phase 1 includes initial geophysical surveys of each burial site to determine the extent of the buried cylinders and initial surface soil sampling of burial site CPP-94. The primary threat at the site is safety.

Phase 2 of the remedy consists of excavation, removal, and management of the cylinders at each site. Excavation will be conducted within a containment structure to ensure that accidental contaminant releases to the environment do not occur. Evaluation and management of the cylinders during Phase 2 will consist of the following:

- Removal and disposal or recycling of empty cylinders
- Removal and verification of cylinders with "known" contents
- Removal and sampling of cylinders with unknown contents
- Re-valving or re-containerization of cylinders with inoperable valves followed by sampling of the gases
- Venting of cylinders containing environmentally benign gases (i.e., compressed air, argon, carbon dioxide, helium, nitrogen, and oxygen)
- Treatment of cylinders containing acetylene or hydrofluoric acid having operable valves followed by disposal or recycling of the cylinder

- Treatment of cylinders containing acetylene or hydrofluoric acid having inoperable valves following valve replacement or recontainerization and subsequent disposal or recycling of the cylinder.

A contractor specializing in gas cylinder removal, treatment, and disposal will perform the activities associated with this alternative.

After removal of the cylinders from the burial sites, a post remediation survey of each burial site will be performed to determine earthwork requirements for the final grading. The burial sites will be graded to blend with the surrounding topography. Clean fills for the final grading will be obtained from an onsite borrow source if necessary.

The Agencies may elect to pursue a contingent remedy of capping in place pursuant to the substantive requirements of IDAPA 16.01.05.008 (40 CFR 264.310) if safety concerns with excavation and removal prevent implementation of the selected remedy.

Alternative 2 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment. The Agencies believe the selected alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

### 11.1.7 SFE-20 Hot Waste Tank System (Group 7)

The selected remedy for the SFE-20 Hot Waste Tank System is Alternative 4—Removal, Treatment, and Disposal. Alternative 4 consists of:

- Institutional controls (i.e., warning signs) until the removal of the tank liquid and sludge
- Sampling the tank contents
- Removal and ex situ treatment of the tank liquid and sludge
- Excavation and removal of the tank, tank vault, pump pit enclosures and other associated structures
- On-site disposal of the tank and associated structures.

Following characterization, the tank liquid will be removed and treated at the PEW evaporator if it meets the specified waste criteria. The tank sludge will be removed and treated (ex situ) using a suitable grout to solidify and stabilize the contaminants in the sludge. The stabilized sludge will then be drummed and disposed either on-Site or off-site at a suitable engineered disposal facility. Depending on waste characteristics, the remaining components of the tank system will be excavated, removed, and disposed in the ICDF or off-site, depending on whether they meet the ICDF waste acceptance criteria. The excavation will be backfilled to grade with clean soils.

It is assumed that the liquid within the SFE-20 tank will meet the PEW WAC. The liquid contents of the tank are consistent with previous INTEC waste processed through the tank system and discharged to the PEW. However, if the PEW is unable to accept the liquid waste or is unavailable at the time the response action is conducted, a small portable evaporator unit would be utilized on-Site; or the waste would be disposed off-site in accordance with the Off Site Rule (40 CFR 300.440).

Alternative 4 is selected because it best meets the five balancing criteria while providing overall protection of human health and the environment and compliance with ARARs. The Agencies believe the selected alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

### 11.1.8 Future Site Closures Under RCRA and D&D

In addition to the 101 CERCLA sites addressed in this ROD, approximately 79 INTEC facilities will be undergoing closure under RCRA/HWMA and D&D in the future, after this ROD becomes final.

To minimize duplication of resources and in keeping with the RCRA/CERCLA Parity Policy, a periodic review will be conducted to evaluate facility closures outside the scope of this ROD to determine what additional sources have been identified, and what impact of these sources may have on the residual risk at OU 3-13. Plans for upcoming RCRA/HWMA and D&D closures will also be evaluated to determine that the closure plans include an approach that ensures the following:

- Both RCRA/HWMA and D&D closures of INTEC facilities will satisfy RAOs, and will not add significantly to human health or environmental risks.

- Risks to human health and the environment resulting from any residual contamination discovered will be evaluated and minimized in order to be consistent with the RAOs identified previously.

### 11.1.9 Five-Year Reviews

The CERCLA 5-year review process will be implemented to ensure protection of human health and the environment at sites where contaminants remain in place at levels that do not allow unlimited or unrestricted current or future use as required under 40 CFR 300.430 and CERCLA Section 121. The schedule for 5-year reviews will be included in the RD/RA Work Plan. Five year reviews will continue to be conducted as long as site access or use restrictions are necessary to remain protective of human health and the environment.

Five-year reviews will also assess the effectiveness of Institutional Controls for sites for which "No Further Action" was recommended and ensure that these sites are not adversely impacted by continued INTEC operations. Any new information acquired regarding the nature and extent of contamination at these sites will be considered during each review

### 11.1.10 Post-Closure Care and Monitoring

Post-closure care and monitoring are included as elements of remedial alternatives for sites where COCs remain in place above risk-based levels. Monitoring and maintenance reports will be considered in 5-year reviews to determine the continued effectiveness of remedies.

## 11.2 Estimated Costs of Selected Remedies

Tables 11-2 through 11-8 provides the estimated capital and operation costs for each group. The costs presented in these tables are –30 to +50 percent estimates according to EPA guidance. A 100 year operation and maintenance period was costed for all of the final actions. Operation and maintenance costs for the interim actions were calculated for the interim action period. A discount rate of 5 percent was used to calculate the NPV.

## 11.3 Expected Outcome of Selected Remedy

For all groups, except the Tank Farm and SRPA interim actions, the expected outcome of the selected remedies is that the cumulative risk, for all pathways at these sites will be reduced to less than $1 \times 10^{-4}$ and other risks will be reduced to a HI less than 2.

The use of industrial health and safety controls and the implementation of DOE radiological control procedures will control worker risk during remedy implementation.

Following the operational control period, the Group 2 Soils Under Buildings and Structures will either be covered by the equivalent of a cap with a 1,000 year design life, or by the overlying buildings. If exposed during D&D activities, contaminated soils will be removed to a minimum of 3 m (10 ft) below grade (if necessary), backfilled with clean fill, and revegetated where appropriate. Where a cap is in place, the area up to the edge of the cap will be available for industrial use. Where soils have been removed, the former soil site will be available for industrial use.

Group 3, Other Surface Soils, will have been excavated and disposed in the ICDF, or suitable off-site facility, and the former release sites will be filled with clean back fill, revegetated where appropriate, and available for industrial use.

The ICDF will remain in place and closed. The supporting facilities will be completely removed and disposed within the ICDF. The ICDF will contain contaminated surface soils from INTEC, and potentially will contain CERCLA wastes from other parts of the INEEL. The cap of the facility will be designed to last 1,000 years, against intrusion from both humans and biota, and minimize infiltration of precipitation through the waste layer. The cap will rise slightly above the surrounding area, and will have a low grade to promote runoff. A 100 m (328 ft) buffer zone will be maintained as part of the exclusion area around the capped area. Institutional Controls will be maintained to prevent unauthorized access to the disposal facility.

Group 4, Perched Water, will have been greatly reduced in areas of saturation, if not completely eliminated. High levels of contamination will remain in place in the subsurface, but these contaminants will be unavailable for either surface exposure or transport to the SRPA. The majority of the contamination is Sr-90, which will decay in place due to its short half-life of approximately 30 years.

Group 5, the SRPA, will meet MCLs outside of the current INTEC security fence by 2095. Institutional controls will be implemented to prevent the use of groundwater inside the current INTEC security fence.

Group 6, Buried Gas Cylinders, will have been removed, and these areas will be available for industrial use.

Group 7, the SFE-20 Hot Waste Tank System, will have been removed, and this area will be available for industrial use.

**Table 11-2.** Estimated Capital and Operations Costs (6 years) for Tank Farm Soils Interim Action Selected Alternative 3. Costs are in 1997 dollars except as noted.

| Cost Elements | Estimated Costs in $ |
|---|---|
| **Capital Costs** | |
| FFA/CO Management and Oversight[a] | 1,574,000 |
| Remedial Design[b] | 235,000 |
| Remedial Action Construction[c] | 10,286,000 |
| Total Capital Cost in FY97 dollars | 12,096,000 |
| **Operation Costs** | |
| Remedial Action Operations[d] | 491,000 |
| D & D of Facilities | NA |
| Surveillance and Monitoring | 3,679,000 |
| Total Operation Cost in FY97 dollars | 4,170,000 |
| **TOTAL PROJECT COST IN FY97 $'s** | **16,266,000** |
| Total Capital Cost in NPV | 11,428,000 |
| Total Operation Cost in NPV | 3,725,000 |
| **TOTAL PROJECT COST IN NPV** | **15,153,000** |

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Work Plan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

**Table 11-3.** Estimated Capital and Operations Costs (100 years) for Soils Under Buildings and Structures Selected Alternative 2. Costs are in 1997 dollars except as noted.

| Cost Elements | Estimated Costs in $ |
|---|---|
| **Capital Costs** | |
| FFA/CO Management and Oversight[a] | 6,748,000 |
| Remedial Design[b] | 910,000 |
| Remedial Action Construction[c] | 524,000 |
| Total Capital Cost in FY97 dollars | 8,182,000 |
| **Operation Costs** | |
| Remedial Action Operations[d] | 9,032,000 |
| D & D of Facilities | NA |
| Surveillance and Monitoring | 676,000 |
| Total Operation Cost in FY97 dollars | 9,708,000 |
| **TOTAL PROJECT COST IN FY'97 $'s** | **17,890,000** |
| Total Capital Cost in NPV | 5,103,000 |
| Total Operation Cost in NPV | 4,076,000 |
| **TOTAL PROJECT COST IN NPV** | **9,179,000** |

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

**Table 11-4.** Estimated Capital and Operations Costs (100 years) for Other Surface Soils Selected Alternative 4A. Costs are in 1997 dollars except as noted.

| Cost Elements | Estimated Costs in $ |
|---|---|
| **Capital Costs** | |
| FFA/CO Management and Oversight[a] | 5,199,000 |
| Remedial Design[b] | 1,699,000 |
| Remedial Action Construction[c] | 85,056,000 |
| Total Capital Cost in FY97 dollars | 91,955,000 |
| **Operation Costs** | |
| Remedial Action Operations[d] | 11,514,000 |
| D & D of Facilities | NA |
| Surveillance and Monitoring | 8,213,000 |
| Total Operation Cost in FY97 dollars | 19,727,000 |
| **TOTAL PROJECT COST IN FY97 $'s** | **111,682,000** |
| Total Capital Cost in NPV | 76,626,000 |
| Total Operation Cost in NPV | 8,283,000 |
| **TOTAL PROJECT COST IN NPV** | **84,909,000** |

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

**Table 11-5.** Estimated Capital and Operations Costs (100 years) for Perched Water Selected Alternative 2. Costs are in 1997 dollars except as noted.

| Cost Elements | Estimated Costs in $ |
|---|---|
| **Capital Costs** | |
| FFA/CO Management and Oversight[a] | 5,036,000 |
| Remedial Design[b] | 3,774,000 |
| Remedial Action Construction[c] | 9,445,000 |
| Total Capital Cost in FY97 dollars | 18,256,000 |
| **Operation Costs** | |
| Remedial Action Operations[d] | 8,171,000 |
| D & D of Facilities | NA |
| Surveillance and Monitoring | 2,892,000 |
| Total Operation Cost in FY97 dollars | 11,063,000 |
| **TOTAL PROJECT COST IN FY97 $'s** | **29,319,000** |
| Total Capital Cost in NPV | 15,320,000 |
| Total Operation Cost in NPV | 4,645,000 |
| **TOTAL PROJECT COST IN NPV** | **19,965,000** |

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

**Table 11-6.** Estimated Capital and Operations Costs (100 years) for Snake River Plain Aquifer Interim Action Selected Alternative 2B. Costs are in 1997 dollars except as noted.

| Cost Elements | Estimated Costs in $ |
|---|---|
| **Capital Costs** | |
| FFA/CO Management and Oversight[a] | 5,300,000 |
| Remedial Design[b] | 4,302,000 |
| Remedial Action Construction[c] | 14,855,000 |
| Total Capital Cost in FY97 dollars | 24,457,000 |
| | |
| **Operation Costs** | |
| Remedial Action Operations[d] | 16,141,000 |
| D & D of Facilities | 1,647,000 |
| Surveillance and Monitoring | 16,911,000 |
| Total Operation Cost in FY97 dollars | 34,699,000 |
| **TOTAL PROJECT COST IN FY97 $'s** | **59,156,000** |
| | |
| Total Capital Cost in NPV | 20,701,000 |
| Total Operation Cost in NPV | 19,149,000 |
| **TOTAL PROJECT COST IN NPV** | **39,850,000** |

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

**Table 11-7.** Estimated Capital and Operations Costs (100 years) for Buried Gas Cylinder Sites Selected Alternative 2. Costs are in 1997 dollars except as noted.

| Cost Elements | Estimated Costs in $ |
|---|---|
| **Capital Costs** | |
| FFA/CO Management and Oversight[a] | 922,000 |
| Remedial Design[b] | 48,000 |
| Remedial Action Construction[c] | 956,000 |
| Total Capital Cost in FY97 dollars | 1,926,000 |
| **Operation Costs** | |
| Remedial Action Operations[d] | NA |
| D & D of Facilities | NA |
| Surveillance and Monitoring | NA |
| Total Operation Cost in FY97 dollars | NA |
| **TOTAL PROJECT COST IN FY97 $'s** | **1,926,000** |
| Total Capital Cost in NPV | 1,834,000 |
| Total Operation Cost in NPV | NA |
| **TOTAL PROJECT COST IN NPV** | **1,834,000** |

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.

**Table 11-8.** Estimated Capital and Operations Costs (100 years) for SFE-20 Hot Waste Tank System Selected Alternative 4. Costs are in 1997 dollars except as noted.

| Cost Elements | Estimated Costs in $ |
|---|---|
| **Capital Costs** | |
| FFA/CO Management and Oversight[a] | 862,000 |
| Remedial Design[b] | 893,000 |
| Remedial Action Construction[c] | 3,008,000 |
| Total Capital Cost in FY97 dollars | 4,763,000 |
| **Operation Costs** | |
| Remedial Action Operations[d] | NA |
| D & D of Facilities | NA |
| Surveillance and Monitoring | NA |
| Total Operation Cost in FY97 dollars | NA |
| **TOTAL PROJECT COST IN FY97 $'s** | **4,763,000** |
| Total Capital Cost in NPV | 4,639,000 |
| Total Operation Cost in NPV | NA |
| **TOTAL PROJECT COST IN NPV** | **4,639,000** |

a. Includes Program Management, RA documentation preparation, RD/RA SOW, RA Workplan, Packaging, Shipping, Transportation documentation, RA Report, WAG-wide RA 5-yr review, RD documentation preparation, Safety Analysis documentation, Sampling and Analysis Plan, and Pre-Final Inspection Report.

b. Includes added institutional controls and title design construction document package.

c. Includes site characterization, construction subcontract, and project/construction management.

d. Includes Program Management, continued and new construction caretaker maintenance, operations, maintenance, materials, and disposal.